Preface

This Report consolidates information on the important international spectrum management activities of the United States Federal Communications Commission (FCC). This compendium surveys the full range of activities encompassed by the management of radio spectrum on an international basis for commercial (non-governmental) uses, including policy formulation and coordination, implementation nationally and internationally through treaties and other instruments, and notification for planning and enforcement purposes. It also catalogues the various bilateral and international radio communication arrangements and agreements to which the FCC is a party. This 1999 Report updates and expands on the previous reports on this subject, which were published in 1997 and 1995. This year's update includes a new chapter on spectrum policy and hyper-links to websites that may be useful to readers.

The Planning and Negotiations Division of the International Bureau has the primary responsibility for carrying out the FCC's broad responsibilities for international negotiations, spectrum policy, and notifications. However, most of the activities described in this Report involve substantial participation by other Bureaus and Offices within the FCC. Additionally, international negotiations require the involvement of other government agencies—most notably, the Department of State and the National Telecommunications and Information Administration (NTIA) of the Department of Commerce.

This is a staff report. It is not the result of any official FCC or government action. As such, no obligations are imposed nor are any rights created by the issuance of this Report. The information presented in this Report is believed to be current and accurate as of June 1999. Readers are cautioned, however, not to derive legal opinions from this Report; but, instead, should consult the original documents cited herein for complete texts and details of the negotiated instruments.

Additional copies of this report may be obtained from the Commission's contractor, International Transcription Services, 1231 20th Street, NW, Washington, D.C., 20036, (202) 857-3800, or at the FCC World Wide Web site: http://www.fcc.gov. Copies of the texts of the international agreements referred to herein are on file in the FCC Office of Public Affairs Reference and Information Center, located in room CY-A257 at the Portals 2 building, 445 12th Street SW, Washington DC 20554, (202) 418-0270.

I hope you will find this Report to be a valuable resource. If you have comments or questions regarding this Report, please contact our Division by calling (202) 418-2150.

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TABLE OF CONTENTS

Appendices

I. EXECUTIVE SUMMARY

Because radio communication services have the potential to produce transmissions that go beyond national borders, international coordination is often required to protect service and avoid interference. This is usually accomplished through bilateral and multilateral treaties and agreements. Whenever new radio communication services are developed, negotiations with affected countries are necessary in order to develop the appropriate agreement. Once the agreement is completed, stations in the new radio communication service are subject to the procedures in the agreement in order to protect their service areas and avoid interference to others. It is the responsibility of the International Bureau's Planning and Negotiations Division to negotiate and tailor these cross-border agreements to satisfy our radio spectrum requirements. After agreements are reached, the Division administers related coordination and notification functions.

This 1999 *Report on International Negotiations, Spectrum Policy, and Notifications* is an update of the 1997 Report and includes new developments both in the Negotiations and in the Notifications sections, as well as a new chapter on Spectrum Policy. In the Negotiations area, many new agreements have been completed, including: (1) a Memorandum of Understanding (MoU) with Mexico concerning the initial deployment of digital television (DTV) stations in the border area; (2) agreements with Canada concerning the U.S. Digital Audio Radio Service (DARS) and Canadian Terrestrial Digital Radio Broadcasting (T-DRB); (3) agreements with both Canada and Mexico concerning digital Muiltipoint Distribution Service (MDS); and (4) an agreement with Mexico reserving certain frequencies in the border area for firefighting and other emergency use. In the Notifications area, several projects are ongoing, including the AM Database Verification Project with Mexico. Meanwhile, the Division's new International Spectrum Branch is preparing for the International Telecommunication Union's World Radiocommunication Conference (WRC-2000) (see also, www.itu.int) next year. Additionally, since our last report, substantial progress has been made in computerizing and modernizing our international notifications, most notably in the automation of the processing of correspondence with the ITU related to Space Services.

In view of a continuing focus on our northern and southern neighbors, we have included in this report separate sections on negotiations with Canada and with Mexico. Each section contains highlighted information on frameworks for negotiation, current activities and accomplishments, existing agreements, and issues for future action. We have also included maps of the U.S./Canadian and U.S./Mexican border areas showing coordination zones for different services.

Since the 1997 Report was published, the Division has been involved in numerous bilateral meetings with Canada and Mexico. There were ten meetings with Canada, including six meetings of the Radio Technical Liaison Committee (RTLC), three meetings on DTV and one meeting on U.S. DARS and Canadian T-DRB. There were seven meetings with Mexico, including two meetings of the Working Group for the Planning of Radio Spectrum (WGPR), and one high level meeting between senior U.S. and Mexican officials.

The Division will continue to work toward enabling our licensees to optimize service possibilities with the fewest administrative and geographic barriers. Over the next twelve months, discussions will continue concerning such matters as DARS, DTV, two-way MDS, the Local Multipoint Distribution System (LMDS), the Wireless Communications Service (WCS), the 220-222 MHz band, and the 24 and 38 GHz bands.

The Division is concentrating on spectrum issues related to the up-coming World Radiocommunication Conference (WRC-2000), specifically, building regional and global acceptance of U.S. views and initiatives by engaging other administrations and organizations in constructive discussions. The FCC, in a coordinated effort with the National Telecommunications and Information Administration (NTIA) (see also, www.ntia.doc.gov) and the Department of State (see also, www.state.gov), is also working to increase the efficient use of spectrum in the global marketplace in order to accommodate innovative new technologies and competitive telecommunications services, thereby expanding services to consumers.

This Report also includes several appendices. Appendix A contains a table of frequency bands subject to international agreements and arrangements with Canada and Mexico. Appendix B contains a listing of Canadian agreements and arrangements. Appendix C contains a listing of Mexican agreements. Appendix D contains the 1996 High Level Consultative Commission Communique and the 1996 and 1998 Work Programs for U.S.-Mexico coordination. Appendix E contains copies of FCC Public Notices concerning international agreements and coordination issued by the International Bureau through June 1999. Appendix F contains detailed charts and graphs of the total volume of international notifications processed by the International Bureau through the third quarter of 1999.

In order to make it as accessible and as widely available as possible, this Report is now accessible on the FCC World Wide Web site: http://www.fcc.gov.

II. NEGOTIATIONS - BACKGROUND

Because radio signals do not recognize national boundaries, all radio communication services can involve a certain amount of transborder transmission and in many cases require international coordination to avoid interference. Some protection is afforded through worldwide international treaties.[1] However, in general, terrestrial stations operating at frequencies above 28 megahertz (MHz) are not covered by worldwide international treaty. Protection for terrestrial stations operating at such frequencies must be obtained through bilateral or regional agreements. The United States (U.S.) has entered into a number of bilateral and regional arrangements for services operating at frequencies above 28 MHz, as well as for selected non-broadcast services operating at frequencies below 28 MHz.[2] Most agreements are with our immediate border neighbors, Canada and Mexico. With respect to broadcast operations that may have extensive geographic reach, particularly AM and high-frequency (HF) radio broadcasting, the U.S. has entered into regional agreements and/or multinational coordinations.[3]

In certain cases, interim working arrangements or memoranda of understanding (MoU) may be negotiated. This is the case most frequently with arrangements negotiated with Canada and Mexico. Both countries observe these interim working arrangements and memoranda of understanding, although they are not binding as a matter of international law. They provide a mechanism for coordinating spectrum allocated for new services in the border areas on a temporary basis until a formal agreement is concluded.

The U.S. delegations to bilateral negotiations are officially organized and led by

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[1] For example, the Radio Regulations established conditions for international recognition and protection of certain categories of frequency assignments made by administrations. See Radio Regulations (International Telecommunication Union, Geneva: Edition 1990, revised 1994 and 1996.) See also, International Telecommunication Convention, (Nairobi, 1982), revised at Nice, 1989, and the Constitution and Convention of the International Telecommunication Union, (Geneva: Edition 1992), revised at Kyoto, 1994.

[2] For the U.S., these agreements may be treaties brought into force after the advice and consent of the Senate, or executive agreements, concluded pursuant to the constitutional authority of the President and existing statutory authority, including the Federal Communications Act of 1934, as amended and 22 U.S.C., §2656. Binding international communications agreements are negotiated and concluded in conjunction with the Department of State in accordance with procedures set forth in 22 C.F.R., Part 181, and Volume 11, Foreign Affairs Manual, Chapter 700 (Circular 175 procedure). These procedures ensure the legal basis of the proposed agreement, appropriate preparations for and conduct of negotiations, and conformance of the text with appropriate form and formalities.

[3] In particular, AM radio is coordinated on a regional basis. The United States must coordinate AM radio with countries in Region 1 - Northern Asia, including Russia; in Region 2 - North, Central, and South America; in Region 3 - Southeast Asia, Australia, and Oceania. Due to propagation characteristics which may affect several other countries, certain aviation, marine and broadcast services are coordinated on a multilateral basis and HF (shortwave) broadcasting is coordinated on an international basis.

the Office of International Communications and Information Policy (CIP), Department of State. CIP obtains the necessary negotiating authority and works with foreign administrations to establish the overall agenda for negotiations at each bilateral session. CIP also coordinates U.S. positions with the expert offices within the FCC, as well as with other U.S. agencies, including the Commerce Department's National Telecommunications and Information Administration (NTIA), the Federal Aviation Administration (FAA), the Coast Guard, Department of Defense (DoD), and the National Aeronautics and Space Administration (NASA), when appropriate. Within the U.S. delegation, the FCC is the lead expert agency with regard to non-government radio frequencies and communications service rules, while NTIA is the lead for government radio frequencies and communications service rules. In the case of shared government and non-government radio frequencies, both agencies work jointly.

Staff of the Negotiations Branch of the International Bureau's Planning and Negotiations Division leads FCC preparation for bilateral negotiations. Preparations are made in close cooperation with other Bureaus and Offices within the FCC that have licensing responsibilities or expert technical knowledge regarding the subject service, including the Mass Media Bureau, the Wireless Telecommunications Bureau, and the Office of Engineering and Technology.

III. NEGOTIATIONS, CONSULTATIONS, AND AGREEMENTS WITH CANADA

A. Canadian Counterpart Authorities

Three Canadian federal authorities are involved in communications coordination issues: Industry Canada (which replaced the former Department of Communications), the Canadian Radio-Television and Telecommunications Commission and the Department of Canadian Heritage.

Industry Canada. Industry Canada is in charge of national economic issues and is the FCC's primary counterpart for technical coordination. Its main role is to provide policy advice, industry sector information, and business services. It is a consolidation of four former departments and agencies. It assumed the former Department of Communication's role in formulating, integrating and coordinating policies and regulations regarding telecommunications, broadcasting, information technologies and competition in the marketplace. It is responsible for issuing licenses, allocating radio frequencies, and establishing national policy for radio communication. Industry Canada represents Canada's interests in bilateral and multilateral negotiations regarding the use of radio spectrum. Of the three agencies discussed here, Industry Canada has the exclusive responsibility to negotiate spectrum issues.

In 1995, Industry Canada reorganized its telecommunications responsibilities. Under the Assistant Deputy Minister for Spectrum, Information, Technologies and Telecommunications, there are four General Directorates: (1) Radiocommunications & Broadcasting Regulation; (2) Spectrum Engineering; (3) Information Technologies Industry; and (4) Telecommunications Policy. Generally, the Spectrum Engineering Directorate is responsible for developing all new spectrum allocation and frequency sharing arrangements with the U.S. The Radiocommunications & Broadcasting Regulation Directorate focuses mainly on in-service non-broadcast and broadcast operations (including notifications, interference resolution, etc.). Some satellite regulatory matters are based in this group as well. (See also, www.ic.gc.ca).

Canadian Radio-Television and Telecommunications Commission (CRTC). All major telecommunications suppliers operating in Canada are subject to the jurisdiction of the CRTC. The CRTC is federally constituted and functions as a quasi-judicial independent body. As the Canadian federal regulatory body, the CRTC's main responsibility is to approve tariffs and rates of return. It also has the power to make regulations, set service standards, authorize construction plans, and investigate company operations. (See also, www.crtc.gc.ca).

Department of Canadian Heritage. The Department of Canadian Heritage is in charge of arts, heritage, culture, and broadcasting. It was established to support and encourage a strong sense of Canadian identity and heritage based on Canadian bilingualism and multiculturalism. The CRTC is part of this Department and reports to Parliament through the Minister of Canadian Heritage. (See also, www.pch.gc.ca).

B. Framework for U.S./Canada Negotiations

Negotiations with Industry Canada on frequency sharing arrangements are conducted in several bilateral arenas involving various U.S. agencies. The State Department has overall lead responsibility. Generally, the FCC participates in discussions and negotiations as one of the primary expert agencies. However, in technical discussions dealing with specific topics of interest, the FCC may take the lead.

Niagara Senior Level Consultative Meetings. The Niagara meetings are the highest level consultations on communications matters involving the most senior officials in Industry Canada, the U.S. State Department (CIP), the FCC, and the NTIA. First held in 1980, the Niagara senior level group meets periodically depending on inter-governmental consultative requirements. The topics discussed cover national, bilateral, and multilateral activities of the two countries.

The last Niagara meeting was held in Washington DC in early 1994. At that meeting, a list of issues to be addressed in the 1994-1995 time frame was drawn up. This list included matters dealing with Direct Broadcast Satellite (DBS) and DARS policy, universal service, TV/media violence, ITU, Inter-American Telecommunications Conference (CITEL) (see also, www.citel.oas.org), transborder satellite policy, cellular resale, international carriers and accounting rates, the North American Numbering Plan, information infrastructure, U.S. and Canadian telecommunications reforms, and issues related to the NAFTA, General Agreement on Trade in Services (GATS) and the Asia Pacific Economic Cooperative (APEC).

High Level Meetings. Other meetings with Canada are conducted on an *ad hoc* basis and include senior FCC and Industry Canada staff. They are overseen by the State Department and scheduled as needed and cover a full range of technical issues, both broadcast and non-broadcast. Some of the meetings are informal and occur in the same time frame as other meetings that representatives of the U.S. and Canada jointly attend, *e.g.*, ITU-R Study Group meetings.

Non-Broadcast Allocations and Technical Coordination. Coordination between the U.S. and Canada for the use of non-broadcast spectrum begins very early in the spectrum allocation and planning process for both countries. Discussions usually begin under the auspices of the Radio Technical Liaison Committee (RTLC). The RTLC provides a forum for direct exchange of information between the technical experts of both countries with the aim of promoting early coordination on spectrum allocations and facilitating achievement of spectrum sharing arrangements necessary for licensing of individual stations. RTLC meetings have been conducted between Industry Canada and the FCC technical experts since the early 1980's, approximately 1-3 times per year. The RTLC exchanges technical and spectrum allocation information, and discusses frequency sharing arrangements for fixed/land mobile terrestrial communications services, leading to arrangements for services including PCS, cellular, and paging. The RTLC discussions are co-chaired by senior-level FCC and Industry Canada officials.

Broadcast Allocations and Technical Coordination. Coordination between the U.S. and Canada for the use of broadcast spectrum is conducted between Industry Canada and FCC broadcast experts under the auspices of State Department's CIP and Industry Canada. Meetings are conducted whenever there is a need (generally once or twice a year) and result in agreements and their associated arrangements.

C. U.S./Canadian Agreements

Broadcast.

There are five agreements currently in effect with Canada:

1) *Agreement Between the Government of the United States of America and the Government of Canada Relating to the AM Broadcasting Service in the Medium Frequency Band*, 1984, for use of the 535-1605 kilohertz (kHz) band;

1a) associated with the AM Agreement is the *Interim Working Arrangement Between the Federal Communications Commission and the Department of Communications Relating to the AM Broadcasting Service in the Medium Frequency Band*, 1991 (amended, 1997), for use of the expanded band 1605-1705 kHz;

2) The FM *Agreement Between the Government of Canada and the Government of the United States of America Relating to the FM Broadcasting Service*, 1991 and its associated *Working Arrangement*;

3) The TV *Agreement Between the Government of Canada and the Government of the United States of America Relating to the TV Broadcasting Service*, 1994 and its associated *Working Arrangement* covers the VHF, and UHF TV bands and the low power television (LPTV) service;

4) *Agreement Concerning the Coordination Between U.S. Satellite Digital Audio Radio Service (DARS) and Canadian Fixed Service and Mobile Aeronautical Telemetry Service in the Band 2320-2345 MHz*, 1998. The Agreement provides U.S. DARS systems the opportunity to operate at power levels sufficient to provide CD-quality audio to U.S. consumers direct from satellite and through ground-based repeaters. Also, it provides protection to receivers located in the U.S. from Canadian transmitters; and

5) *Agreement on Coordination of Canadian Terrestrial Digital Radio Broadcasting (T-DRB) at 1452-1492 MHz and U.S. Aeronautical Telemetry at 1435-1525 MHz*, 1998.

Non-Broadcast.

The principal agreement governing the allocation and use of frequency bands by terrestrial non-broadcasting radiocommunications services along the common border is the *Agreement Concerning the Coordination and Use of Radio Frequencies Above Thirty Megacycles per Second, with Annex* (Above 30 MHz Agreement). This agreement was signed into effect on October 24, 1962, and has been subsequently amended. This agreement covers both government and non-government frequency use, and covers frequency bands utilized in such diverse services as aeronautical mobile, maritime public correspondence, railroad radio, air-to-ground radio, land mobile, cellular radio, personal communications service, point-to-point and point-to-multipoint services, paging, multipoint distribution services and fixed microwave operations.[4]

The Above 30 MHz Agreement is comprised of the six "Arrangements" which address different sets of frequency bands. These arrangements identify coordinating agencies and establish coordination procedures for different frequency bands, including specification of the distance from the border within which coordination must take place.

Coordination under this agreement is generally made with reference to coordination zones that are encompassed by the geographical lines, "Lines A, B, C, and D", that are described in the agreement (see U.S./Canadian Border Coordination Maps). "Line A" is used to define the coordination zone in the U.S. along the main U.S.-Canada border while "Line B" fulfills the same requirement on the Canadian side. "Lines C and D" are used to establish the coordination zones along the Alaska-Canada divide (see U.S. Alaskan/Canadian Border Coordination Map). The coordination distance from the border following these Lines is generally about 70 miles, but the distance is variable where the border diverts non-linearly. There are instances, particularly in some of the interim working arrangements, where these Lines are not applicable and actual distances are specified.

Since the Above 30 MHz Agreement originally became effective, in addition to the amendments that have been made, interim working arrangements have been adopted for certain non-government bands. These typically address certain services within specified band segments and are associated with one of the six Arrangements. Frequently, the coordination and notification procedures set forth in the interim working arrangements are specified through reference to one of the six Arrangements.

The six Arrangements of the Above 30 MHz Agreement are as follows:

- Arrangement A: *Arrangement Between the Canada Department of Transport and the U.S. Federal Communications Commission for the Exchange of Frequency Assignment Information and Engineering Comments on Proposed*

[4] Frequency coordination under this Agreement involves both government and non-government (commercial) spectrum and is performed by a number of agencies within both governments. Under this agreement, the FCC coordinates with Industry Canada on non-government use and jointly with other U.S. agencies for shared spectrum use.

Assignments along the Canada United States Borders in Certain Bands Above 30 Mc/s.

This Arrangement is the primary instrument for FCC/Industry Canada non-government, non-broadcast coordination of the fixed and land mobile services.

- Arrangement B: *Arrangement for the Exchange of Frequency Assignment Information and Engineering Comments on Proposed Assignments along the Canada-United States Borders in Certain Aviation Bands.*

  This Arrangement is the cornerstone of notifications relating to aeronautical services. The Federal Aviation Administration is the primary administrator for the coordination of radionavigation and radiocommunication functions in these bands; however, the FCC has responsibility in certain bands subject to this Arrangement.

- Arrangement C: *Arrangement for Frequency Coordination of Fixed Installation Radars.*

  This Arrangement is primarily associated with defense-related radar use on government frequency bands and is administered by the Joint Chiefs of Staff.

- Arrangement D: *Arrangement Between the Canada Department of Transport and the U.S. Interdepartment Radio Advisory Committee (IRAC) for the Exchange of Frequency Assignment Information and Engineering Comments on Proposed Assignments along the Canada-United States Borders in Certain Bands Above 30 Mc/s.*

  This Arrangement relates to coordination of terrestrial and earth station frequency assignments that are within the shared government and non-government frequency bands specified therein. IRAC functions as the U.S. coordinating entity for these bands.

- Arrangement E: *Arrangement Between the Department of Communications of Canada and the National Telecommunications and Information Administration and the Federal Communications Commission of the United States Concerning the Use of the 406.1 MHz to 430 MHz Band in Canada-United States Border Areas.*

  This Arrangement establishes the procedures for the use of the band 406.1-430.0 MHz by fixed and mobile services; and for use of the band 420-430 MHz for the radiolocation service within the U.S. and for the mobile (primary) and fixed (secondary) services within Canada. NTIA is the coordinating agency for the U.S.

- Arrangement F: *Arrangement Between the Department of Communications of Canada and the Federal Communications Commission of the United States Concerning the Use of the Band 806 to 890 MHz along the Canada-United States Border.*

  This Arrangement covers the coordination of land mobile radio services operating in the 806-890 MHz band in the border area.

Associated arrangements and attachments listed by service category and organized from low to high frequency bands are as follows:

- Aeronautical Mobile (R) Services:

  128-132 MHz: *Interim Arrangement on the Coordination and Use of 25 kHz Frequency Assignments in the Aeronautical Mobile (R - en route) Service Sub-band 128.8125-132-0125 MHz*. A table specifies the channels designated for use by each of the Administrations. Signed: December 20, 1977, and associated with Arrangement B.

  136.5-137.0 MHz: *Interim Channeling Arrangement for the Aeronautical Mobile (R) Service Utilizing 25 kHz Channels for the Band 136-137 MHz*. A table specifies the channels specified for use by the Administrations. Signed: January 15, 1992, and associated with Arrangement B.

- Maritime Mobile:

  Appendix 18 (156.8/162.0 MHz): Revised Attachments A and B to Arrangement A. Maritime Mobile Frequencies Appearing in Appendix 18 of the international Radio Regulations. Signed: June 8, 1973.

  Vancouver/Seattle Area (156.55/156.72 MHz): Attachment C to Arrangement A. Frequency Usage for Vessel Traffic Systems in the General Vancouver/Seattle Area. Signed: August 2, 1976.

  West Coast VHF (156/174 MHz): Revised Attachment D to Arrangement A. Channeling Arrangement for the West Coast VHF Maritime Public Correspondence. Signed: February 20, 1984.

  157 MHz: *VHF Channeling arrangement for Parallel Mobile Public Correspondence on the Great Lakes and the St. Lawrence Seaway/Agreement to Promote Safety on the Great Lakes by Means of Radio*. Signed: December 29, 1978, and associated with Arrangement A.

- Railroad Radio:

  ***160-161 MHz**: Arrangement for Railroad Radio Frequency Assignment Plan for 30 kHz Narrow-Band Assignments*. Signed: July 28, 1960, and associated with Arrangement A.

- Air/Ground Radio:

  454-459 MHz: *Arrangement for 400 MHz Air/Ground Channel Designations and Frequency Assignments*. Twelve 25 kHz channel pairs are established for use on a geographic/coordination basis. Signed: June 24, 1971, and associated with Arrangement A.

  849-851/894-896 MHz: *Interim Arrangement Concerning Air-to-Ground Radio Services*. Covers the coordination and operation of air-to-ground, ground-to-air stations and applies to properly situated ground stations within 885 km of the border. Ten multichannel blocks are fully available to both countries. Signed: August 28, 1992, and associated with Arrangement F.

- Land Mobile Services:

  806-890 MHz: *Arrangement for the Use of Land Mobile Services*. Amended the Agreement Concerning Allocation of UHF TV Channels. (This is the basis for Arrangement F). Signed: April 7, 1982.

  821-824/866-869 MHz: *Interim Arrangements for Land Mobile Radio*. Arrangement allots channel pairs evenly; power and height limits are imposed where they fall into the 3 sharing zones and 2 protection zones that are defined in the document. There are also 5 nationwide public safety channel mutual aid channel pairs specified. Signed: August 15, 1990, and associated with Arrangement F.

  896-901/935-940 MHz: *Interim Arrangement for Land Mobile Service*. Arrangement is effective within 140 km of the border. Frequencies are divided evenly on an *a priori* basis and different power and antenna height restrictions apply depending upon which sharing zone the station is located. Signed: August 15, 1990, and associated with Arrangement F.

- Cellular Services:

  824-825/845-849/869-870/890-894 MHz: *Arrangement Concerning Cellular Radio Systems*. Terms call for equal spectrum sharing through close technical coordination. In general, a maximum signal limit of 35 dBuV/m at the border is permitted. Signed: January 8, 1990, and associated with Arrangement F.

- Personal Communications Services:

  901-902/930-931/940-941 MHz: *Interim Arrangement for Narrowband PCS.* Establishes a common plan for the equitable use of these bands for Narrowband PCS Systems within a distance of 120 km from the common border. The Arrangement establishes a channel plan that includes 15 paired channels and 9 unpaired channels per Administration. Where operators agree to share a channel, such agreements are to be submitted to the Administrations for review. Signed: September 22, 1994.

  1850-1990 MHz: *Interim Arrangement for Broadband PCS*. Establishes a common plan for the shared and equitable use of the band for Broadband PCS within a 72 km distance from the common border. The band 1910-1930 MHz is reserved for low power unlicensed PCS. All PCS systems must be coordinated with any potentially affected existing fixed point-to-point operations within 120 km from the common border. No new fixed systems will be authorized in the band. Where operators agree to share channels, such arrangements are to be submitted to Administrations and are subject to review. Signed: November 14, 1994, and associated with Arrangement A.

- Point-to-Multipoint Services:

  928-929/952-953 MHz: *Arrangement Concerning Point-to-Multipoint Systems*. Using Lines A, B, C, & D as general limiting distances, bands are divided into 3 groups with each country receiving a priority segment plus a third common band segment, use subject to case-by-case coordination. Signed: August 7, 1991.

- Paging:

  All Paging Frequencies: *Arrangement on Trans-Border Paging Operation*. Specifies the terms for acceptability of transborder paging operations while also noting the undesirability of the offering of service to subscribers of the other country. Signed: June 25, 1971.

  929-932 MHz: *Interim Arrangements on Paging Operations*. Using Lines A and B for the 929 MHz band allots 929.0-929.5 MHz for Canadian use and 929.5-930.0 for U.S. usage. For the 931 MHz segment, the channel distribution varies in specified population centers, but elsewhere across the border it is evenly divided between the two countries including 3 common nationwide channels. Signed: January 11, 1994; August 14, 1992; April 20, 1988; February 10, 1987; and September 14, 1983.

- Point-to-Point and Point-to-Multipoint Fixed Services:

932-935/941-944 MHz: *Interim Arrangement on Point-to-Point and Point-to-Multipoint Fixed Services.* Within Lines A, B, C, & D provides priority use for Canadians systems in 932.0-932.25 MHz and 941.0-941.25 MHz bands, and priority use for the U.S. in the 932.25-932.50 MHz and 941.25-941.50 MHz bands. The remaining portions of the bands are subject to the terms of Arrangement A with slight modification. Signed: September 19, 1994, and associated with Arrangement A.

- Multipoint Distribution Services:

  2500-2686 MHz: *General FCC/DOC Understanding Concerning the Coordination of the Band within 80 km of the Border* (31 MDS Channels). Terms apply to operations within 80 km of the border. Both countries have access to all channels. Use of frequency offset and antenna gain and polarization criteria specified; a coordination threshold PFD at the border of -70 dBW/m2. Signed: March 23, 1989. In 1997, the agreement was amended to permit the use of digital technology. Amended agreement signed: December 5, 1997.

- Fixed and Mobile Services:

  4400/5000 MHz: Signed August 12, 1984.

  17.7-23.6 GHz (for specific band segments): *Interim Arrangement for Coordination of Fixed and Mobile Stations*. Supersedes the provisions of the Above 30 MHz Agreement by requiring the coordination of all fixed and mobile services in the specified band segments. Signed: July 8, 1995.

- Satellite Services:[5]

  All Satellite News-Gathering (SNG) Frequencies: Understanding Concerning U.S./Canada Cross-Border Roaming of SNG Units. Signed: August 1992.

  In August 1992 there was an exchange of letters between the FCC and the Canadian Department of Communications (now Industry Canada) that defined SNG, for purposes of service implementation in the two countries. Additionally the letters provided an expedited procedure for the authorization of the cross-border roaming of SNG units between the two countries while remaining in communication using that country's space segment. Finally, the letters reserved the right for each governmental authority to review such temporary authorizations after a reasonable period to determine if the other country's space segment can provide the necessary facilities, while considering the needs for flexibility and for appropriate utilization of in-orbit facilities.

[5] A full description of all satellite coordination between the U.S. and other countries is beyond the scope of this Report.

Transborder Satellite Policies for Very Small Aperture Satellite (VSAT) Earth Stations. This series of letters exchanged between the FCC and Canada's Department of Communications (now Industry Canada) outlines the policies and conditions for the use of U.S. and Canadian VSATs and fixed-satellite service satellites in each country. Dated: 1972, 1982, and 1989.

Mobile Satellite Terminal Cross-Border Roaming. This exchange of letters facilitated U.S./Canadian cross-border roaming of certain MSS/RDSS mobiles using the Geostar and Qualcomm satellite systems. Dated: April/May 1991.

Trilateral Arrangement Regarding the Use of the Geostationary Orbit Reached by Canada, Mexico and the United States. This "working arrangement" provides for the shared use of the geostationary orbit between 103 degrees W.L. and 123 degrees W.L., and of the 3700-4200 MHz, 5925-6425 MHz, 11.7-12.2 GHz, and 14.0-14.5 GHz frequency bands. FCC Public Notice dated: September 2, 1988.

Broadcast Satellite /Fixed Services. Coordination of systems operating in the 17.7-19.7 GHz and 21.2-23.6 GHz bands. Signed: July 8, 1995.

Memorandum of Understanding for Intersystem Coordination of Certain Geostationary Mobile Satellite Systems operating in the bands 1525-1544 MHz, 1545-1559 MHz, 1626.5-1645.5 MHz, and 1646.5-1660.5 MHz. This Multilateral Arrangement was signed in Mexico City and it facilitates the operation of the American Mobile Satellite Corporation, Inc. (AMSC) system of the U.S. Signed: June 19, 1996.

Additional information on the interim working arrangements for which the FCC has coordination responsibilities is listed in Appendices A and B.[6]

D. Overview of Activities and Accomplishments[7]

January 1997 U.S./Canada DARS Bilateral Meeting. The previous three DARS Bilateral meetings began coordination of U.S. and Canadian plans for the establishment of digital audio broadcasting services that were allocated by WARC-92. In accordance with WARC-92 allocations, each country will operate in different frequency bands and must share with other terrestrial services in the other country; the U.S. plans satellite operation in the S-Band while Canada plans terrestrial operation in the L-Band. Coordination requirements of U.S. aeronautical telemetry and coordinate requirements for Canadian fixed and aeronautical telemetry services were discussed. During the fourth meeting, the status of activities occurring in both countries since the last meeting was

[6] The tables in Appendix A present this information organized by frequency band.

[7] A summary of meetings held prior to 1997 can be found in the Division's previous report, published in 1997.

reviewed. Industry Canada presented a proposal for use of the L-Band and there was discussion on the progress of coordination studies in both the L and S bands.

January 1997 Bilateral Meeting of the U.S./Canada RTLC. Sharing coordination issues addressed at this meeting included the draft 220-222 MHz sharing arrangement, non-DARS (2.3 GHz), review of the current 2.5 GHz (MDS) agreement, 4.6 GHz for General Wireless Communications Service, LMDS/LMCS (28-31 GHz) and in the bands between 36 and 51 GHz. Information exchange items included refarming, wireless access at 3.5 GHz, 5 GHz unlicensed operation, NTIA/FCC spectrum transfer, allocations above 40 GHz, FCC auction update, intercarrier arrangements between Canadian and U.S. licensees, and progress on the rewrite of the Above 30 MHz Agreement.

March 1997 U.S./Canada DARS Bilateral Meeting. This was the fifth meeting on this subject. The status of activities occurring in both countries since the last meeting was reviewed. The U.S. presented a revised proposal for use of the L-Band. Canada agreed to discuss it with its industry and inform the U.S. of the results. There was discussion on the progress of coordination studies in both the L and S bands in efforts to increase compatibility of the proposed services of the two countries. It was agreed to continue work on various interference relationships and continue investigating mitigation techniques for the next meeting.

March 1997 Bilateral Meeting of the U.S./Canada RTLC. Topics addressed at this meeting included review of the 2.5 GHz MDS Agreement, update on the draft 220-222 MHz sharing arrangement, LMDS/LMCS (28 GHz), and 36-51 GHz uses.

August 1997 U.S./Canada DTV Bilateral Meeting. Discussions included an update on the status of future plans for DTV in the U.S. and in Canada, on the U.S. allotment plan, on the Canadian approach to DTV planning and draft preliminary allotment plan. There was an exchange of letters concerning coordination of Canadian NTSC assignments and a discussion on the method of dealing with NTSC and DTV notifications during the transition period.

February 1998 U.S./Canada RTLC Bilateral Meeting. The following sharing/coordination issues were addressed: the 220-222 MHz band, LMCS, 800-900 MHz land mobile, and the 38.6-40 GHz band. Information exchange items addressed included frequency bands for fixed wireless access, return channels for MDS/MCS and 23 GHz MCS. There were information exchanges for the following new services: high altitude platforms and other fixed systems in the 37-42.5 GHz and 47.2-48.2 GHz bands, wireless meter reading, license-exempt equipment in U.S. (impact on Canada), and the use of bands 2025-2130 and 2110-2165 (TV pickups) and its impact on IMT-2000 emerging services.

March 1998 U.S./Canada RTLC Bilateral Meeting. The following sharing/coordination issues were addressed: the 220-222 MHz band, LMDS/LMCS, 800-900 MHz land mobile, WCS and GWCS and the 38.6-40 GHz band. Information exchange items addressed included frequency bands for fixed wireless access and return

channels for MDS/MCS. There were information exchanges for the following new services: high altitude platform stations and fixed and fixed-satellite systems in the 37-51 GHz band, wireless meter reading, and license-exempt equipment.

April 1998 U.S./Canada RTLC Bilateral Meeting. The following sharing/ coordination issues were addressed: the 220-222 MHz band, LMDS/LMCS, 800-900 MHz land mobile, the U.S. 1910-1930 MHz unlicensed PCS band, the 3.4-3.7 GHz band, and the 38.6-40 GHz band. Information exchange items addressed included return channels for MDS/MCS, MCS at 18 and 23 GHz, and operations at 24 GHz (BSS allocation and DEMS). There were information exchanges for the following new services: fixed and fixed-satellite systems in the 37-51 GHz band, wireless meter reading (1427-1430 MHz), re-allocation of the UHF-TV channels 60-69, Superphone (800-900 MHz), and ITS.

June 1998 U.S./Canada DARS/T-DRB Bilateral Meeting. U.S. discussed the status of its DARS licensees and their effect on terrestrial systems in Canada. Canada discussed the status of its T-DRB systems. Draft arrangements were worked on.

June 1998 U.S./Canada DTV Bilateral Meeting. Canada discussed the public notice of its DTV allocation plan. U.S. discussed its schedule for DTV notifications. There was discussion of the draft MoU and discussions of the remaining DTV incompatibilities.

November 1998 U.S./Canada DTV Bilateral Meeting. There was discussion of the status of DTV in the U.S. and Canada, NTSC notifications, and of resolving incompatibilities in the DTV plans.

November 1998 U.S./Canada RTLC Bilateral Meeting. The following sharing/ coordination issues were addressed: the draft 220-222 MHz band agreement, Canada tabled draft interim arrangements for LMCS/LMDS, wideband systems in 24 and 38 GHz bands, preliminary draft for the 3.4-3.7 GHz band, Aeronautical and Maritime De-licensing, GWCS, two-way MDS/MCS, and cross-border coordination process. Information exchange items addressed included 36-51.4 GHz band, TV pickup/BAS, ITS (5.9 GHz), and WCS.

February 1999 U.S./Canada RTLC Bilateral Meeting. The following sharing/ coordination issues were addressed: Canada's amateur operators in the draft 220-222 MHz band, Canada tabled further draft interim arrangements for LMCS/LMDS, for wideband systems in 24 and 38 GHz bands and further preliminary draft for the 3.4-3.7 GHz band; Aeronautical and Maritime De-licensing, GWCS, two-way MDS/MCS, and cross-border coordination process. Information exchange items addressed included U.S. NPRM on 18 GHz band, 36-51.4 GHz band, TV pickup/BAS, ITS (5.9 GHz), and WCS. There was a subsequent telephone conference call in April to discuss the LMDS/LMCS and 24/38 GHz band drafts.

April 1999 U.S./Canada RTLC Bilateral Meeting. The following sharing/coordination issues were addressed: the 220-222 MHz band, LMDS/LMCS and 24/38 GHz band draft arrangements, MCS/MDS low power gap fillers and the MCS (2.5 GHz) grandfathering list. Information exchange items addressed included the 36-51.4 GHz band, WCS, 3.4-3.7 GHz FWA, TV Pickup/BAS, and ITS (5.9 GHz).

April 1999 U.S./Canada DTV Bilateral Meeting. There was an update on the status of DTV in the U.S. and Canada. It was noted that there have not been any problems for either country with NTSC notifications. There was a review of the cases that Canada indicated needed resolution.

E. Issues for Future Action

Future issues to be discussed include agreements concerning DTV, LMDS, the 24 and 38 GHz bands, the 220-222 MHz band, and two-way MDS, and improvements in the U.S.-Canada cross-border coordination process.

IV. NEGOTIATIONS, CONSULTATIONS, AND AGREEMENTS WITH MEXICO

A. Mexican Counterpart Authorities

Secretaría de Comunicaciones y Transportes (SCT). The highest Mexican authority over telecommunications matters is Secretariat of Communications and Transports, led by a cabinet level Minister. The Minister officially signs all international telecommunications agreements. The Subsecretariat of Communications and Technological Development, led by an Undersecretary, is directly responsible for day-to-day regulatory decisions. These entities are referred to collectively in this report as the SCT. Within the SCT, the Coordinator for International Negotiations, who reports directly to the Undersecretary, leads the discussions of delegations for bilateral treaties. As in the U.S., the Coordinator brings experts together, as required, from the SCT as well as other Mexican government agencies and state-owned companies to address the points of bilateral discussions. (See also, www.sct.gob.mx).

The Comision Federal de Telecomunicaciones (known as COFETEL or CFT). Established in 1996, COFETEL is the primary telecommunications regulatory body in Mexico, although SCT retains certain important responsibilities. On some issues, COFETEL makes decisions requiring little, if any input from SCT; while on other issues COFETEL must obtain the approval of SCT or SCT has the lead. In general, most international issues should be coordinated with the SCT and COFETEL. Major COFETEL decisions are made by vote of a four person Commission, with the Chairman having the deciding vote. According to Mexican law and regulations, the COFETEL's functions with respect to radio include: carry out studies; grant, modify and revoke concessions (licenses) and permits; submit (for approval by the SCT) a frequency allocation and coordination program; administer the radio-electric spectrum; coordinate (with the SCT) frequency issues regarding satellites; establish mandatory equipment standards; certify equipment; and establish and maintain a registry of telecommunications. In its role as federal administrator of radio spectrum, COFETEL sets parameters for power, modulation and other technical issues, grants equipment approvals, establishes auction processes, maintains databases of users and frequencies, and performs technical analysis. The SCT seeks the opinion of COFETEL's technical experts before publishing decisions. (See also, www.cft.gob.mx).

Telecomunicaciones de Mexico (TELECOMM). TELECOMM is the Mexican government-owned satellite administration. Currently, TELECOMM participates in all international negotiations concerning space station and ground station coordination. Governmental responsibilities for satellite-related coordination ultimately will be undertaken directly by the SCT.

B. Framework for U.S./Mexico Negotiations

U.S. negotiations with Mexico regarding border frequency sharing arrangements are led by State Department's CIP with the FCC participating as one of the primary expert agencies. They are organized under the auspices of the High Level Consultative Commission on Telecommunications (HLCC), originally constituted in 1990. This high level meeting of senior U.S. and Mexican government officials is convened approximately every two years or as needed for the exchange of views on important regulatory, standards, administrative and telecommunications policy issues; for the signature of new agreements and protocols; and for the establishment of cooperative work plans.

At the fourth U.S./Mexico HLCC meeting[8] held in Williamsburg, Virginia, in June 1994, a landmark Framework Agreement was signed that consolidated a large number of agreements and memoranda of understanding previously reached between the U.S. and Mexico, and established an efficient procedure for entering into additional agreements, called "protocols," that become amendments to the Framework Agreement and are thus binding international agreements. The fifth HLCC meeting was held in Morelia, Mexico in April 1996. At this meeting new protocols on aeronautical radionavigation and communications service and point-to-point microwave services were signed.

In Washington, D.C. in September 1998, a high level meeting was held between senior U.S. and Mexican officials. At this meeting, the parties discussed DARS coordination. In addition, the parties agreed to finalize an agreement covering digital MDS systems and an agreement reserving certain frequencies in border areas for firefighting and other emergency use, and adopted a 1998-1999 Work Plan.[9]

Broadcast and Non-Broadcast Consultations. Generally, two non-broadcast and two broadcast bilateral meetings take place on an annual basis between sessions of the High Level Consultative Commission. These negotiations are organized and led by the State Department, with participation by the FCC and other federal agencies, as appropriate. The negotiations follow agendas set in cooperation with the SCT consistent with the work plan established at the most recent HLCC Meeting. The negotiations, which may span several months, if not years, ultimately yield agreements (or protocols/memoranda of understandings) which the senior officials of the particular agencies affected may sign.

Interference Resolution-Mixed Commission.[10] To facilitate interference-free operations in accordance with existing frequency sharing protocols and agreements,

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[8] Prior meetings of the High Level Consultative Commission were held at Cocoyoc, Morelos (September 1990), Chestertown, Maryland (July 1991), and Queretaro, Mexico (August 1992).

[9] A copy of the 1998-1999 U.S./Mexico Work Plan is contained in Appendix D.

[10] Also referred to (in Spanish) as the "Comision Mixta Encargada de Resolver Asuntos de Radiointerferencia" (CMERAR).

informal meetings are held as needed between the FCC's Compliance and Information Bureau's (CIB) regional monitoring offices and the SCT regional spectrum administration officials. During these meetings of the "Mixed Commission," specific interference cases are analyzed relative to existing treaty specifications and agreement is often reached on means to eliminate the interference. CIB may bring in technical representatives of the affected licensees and other FCC experts to facilitate the discussions. Additionally, the Notifications Branch, in cooperation with the CIB, maintains the *Mexican Interference Database and Updates*, a report that documents events and activities relevant to dozens of pending interference cases affecting U.S. stations. The report provides a comprehensive centralized resource to assist in the coordination process by supplying a chronological history of the individual cases and their associated technical details. Specific interference cases are coordinated with representatives of the SCT headquarters and field staffs, with input from representatives of the affected stations and their engineering and legal representatives.

C. U.S./Mexico Agreements

Broadcast.

There are two AM agreements with Mexico:

1) *Agreement Between the Government of the United States of America and the Government of the United Mexican States Relating to the AM Broadcasting Service in the Medium Frequency Band*, 1986 for use of the 535-1605 kilohertz (kHz) band; and

2) *Agreement Between the Government of the United States of America and the Government of the United Mexican States for the Use of the Band 1605 to 1705 kHz in the AM Broadcasting Service*, 1992 for use of the AM expanded band 1605-1705 kHz.

An FM *Agreement Between the Government of the United States of America and the Government of the United Mexican States Relating to the FM Broadcasting Service in the 88-108 MHz Band* was signed in 1992.

The following two TV agreements with Mexico provide for low power TV (LPTV) usage and were amended in 1988:

1) *United States-Mexico VHF Television Agreement*. Signed: 1962; and

2) Agreement Relating to Assignments and Usage of Television Broadcasting Channels in the Frequency Range 470-806 MHz (Channels 14-69) Along the United States-Mexico Border. Signed: 1982.

A recent Memorandum of Understanding (MoU) concerning Digital Television (DTV) was signed July 22, 1998:

Memorandum of Understanding Between the Federal Communications Commission of the United States of America and the Secretaria de Comunicaciones y Transportes of the United Mexican States Related to the Use of the 54-72 MHz, 76-88 MHz, 174-216 MHz and 470-806 MHz Bands for the Digital Television Broadcast Service Along the Common Border.

Non-Broadcast.

The *Agreement Between the Government of the United States of America and the Government of the United Mexican States Concerning the Allocation and Use of Frequency Bands by Terrestrial Non-Broadcasting Radiocommunication Services Along the Common Border* (Framework Agreement) was signed at the 4th HLCC meeting in June 1994 on behalf of the U.S. by all three of the senior U.S. telecommunications officials.[11]

The Framework Agreement deals with a range of non-broadcast issues and provides for the attachment of service-specific protocols, which may be agreed upon from time to time between the regulatory authorities of each country, specifically the SCT and the FCC.[12] Each individual protocol sets forth channel allotments and conditions for use for the subject service. The six original protocols annexed to the Framework Agreement in 1994, represented (1) updated consolidations of prior agreements and memoranda of understanding (MoU) reached at previous Consultative Commission meetings,[13] and (2) new agreements on selected fixed and mobile service topics. Following the 4th HLCC meeting two new protocols were signed, and at the 5th HLCC meeting two additional protocols were signed. A structural index of the Framework Agreement is contained in Appendix C.

- Terrestrial Non-Broadcasting Radiocommunications Services:

  Agreement Between the Government of the United States of America and the Government of the United Mexican States Concerning the Allocation and Use of Frequency Bands by Terrestrial Non-Broadcasting Radiocommunications Services Along the Common Border (1994 Framework Agreement). The 1994 Framework Agreement (and its associated protocols) was established to ensure the equitable use of frequency bands by terrestrial non-broadcasting radiocommunications services in the common border area. The allocation of bands for specific radio services and the conditions for their use are set forth in protocols that are attached as annexes to the Framework Agreement. This

[11] Ambassador Vonya B. McCann, Deputy Assistant Secretary of State for International Communications and Information Policy; Reed E. Hundt, Chairman, Federal Communications Commission; and Larry Irving, Assistant Secretary of Commerce for Communications and Information.

[12] Appropriate Circular 175 Authority will be required for new topics.

[13] The prior versions of the agreements and MoUs consolidated into the Framework Agreement were thereby terminated.

agreement was signed on June 16, 1994, in Williamsburg, VA and entered into force on June 2, 1995.[14] These protocols, which concern a variety of land mobile services (including SMR, cellular and PCS) as well as public air-to-ground and fixed point-to-multipoint services, are briefly summarized below. All Agreements were signed in June 1994 unless otherwise noted.

- Specialized Mobile Radio Services:

  220-222 MHz: *Protocol Concerning the Allocation and Use of the Channels in the 220-222 MHz Band for Land Mobile Services Along the Common Border*. It establishes a common plan for the use of this band within a 120 km distance on each side of the border. This band has been allocated in the U.S. for use by the Specialized Mobile Radio Service (SMRS).

- Land Mobile Services:

  470-512 MHz: *Protocol Concerning the Use of the 470-512 MHz Band for Land Mobile Services Along the Common Border*. This band is allocated to both land mobile and (television) broadcasting services. This protocol recognizes the differing levels of requirements for these services in the two countries and establishes a requirement to coordinate assignments made for stations within 150 km of the common border (a greater distance may be agreed for assignments near the Pacific coast).

  806-824/851-869 and 896-901/935-940 MHz: *Protocol Concerning the Use of the 806-824/ 851-869 and 896-901/935-940 MHz Bands for Land Mobile Services Along the Common Border*. This Protocol establishes a common plan for the use of frequencies for Land Mobile services which include Public Safety Mutual Aid and SMRS within a 110 km distance from the border. The channels are evenly divided as specified in the appendices to this Protocol.

- Cellular Services:

  824-849/869-894 MHz: *Protocol Concerning the Use of the 824-849/ 869-894 MHz Bands for Public Radiocommunications Services Using Cellular Systems Along the Common Borde*r. This Protocol establishes the technical parameters for cellular systems in these bands and a requirement for coordination within a 72 km distance from the common border. Coordination occurs directly between the carriers licensed in each country and the conclusions are subject to approval by each administration.

[14] The two protocols concerning Personal Communications Service (PCS) also are formally associated with the 1994 Framework Agreement, but were signed in Washington, D.C. on May 16, 1995 and entered into force on that same date.

- Air-to-Ground Services:

  849-851/894-896 MHz: *Protocol Concerning the Use of the 849-851/ 894-896 MHz Bands for Public Air to Ground Radio Services*. This Protocol establishes a common plan for the use of frequencies within an 885 km distance from the common border for Public Air to Ground Radio Service. The spectrum is divided into 10 channel blocks and each specific site is coordinated. Channel blocks are assigned to specific sites. Sites not already specified require individual coordination.

- Fixed Point-to-Multipoint:

  932-932.5/941-941.5 MHz: *Protocol Concerning the Allotment and Use of the 932.0-932.5/ 941.0-941.5 MHz Bands for Fixed Point-to-Multipoint Services Along the Common Border*. This Protocol establishes an allotment plan for the use of the channels within a 113 km distance from the common border for fixed point-to-multipoint radiocommunications stations.

- Fixed Point-to-Point:

  932.5-935/941.5-944 MHz: *Protocol Concerning the Allotment and Use of the 932.5-935/941.5-944 MHz Bands for Fixed Point-to-Point Services Along the Common Border*. This Protocol establishes an allotment plan for the use of the channels within a 60 km distance from the common border for fixed point-to-point radiocommunication stations.

- Personal Communications Services:

  901-902/930-931 MHz: *Protocol Concerning the Allocation and Use of the Bands 901-902 MHz, 930-931 MHz, and 940-941 MHz for Personal Communications Services Along the Common Border*. This Protocol establishes a channel plan for the equitable use of these bands for Narrowband PCS Systems within a distance of 120 km from the common border (see U.S./Mexican Border Coordination Map). The agreement establishes a channel plan that includes 15 paired channels and 9 unpaired channels per administration. Where operators agree to share a channel, such arrangements are to be submitted to the administrations for review.

  1850-1990 MHz: *Protocol Concerning the Use of the Band 1850-1990 MHz for Personal Communications Services Along the Common Border*. This Protocol establishes a common plan for the equitable use of the band for Broadband PCS within a 72 km distance from the common border. The band 1910-1930 MHz is reserved for low power unlicensed PCS. All PCS systems must be coordinated with any existing fixed point-to-point stations. The Protocol provides protection for existing fixed point-to-point operations within 120 km from the common border. However, the countries agree that

no new fixed systems will be authorized in the band. Use in the border area is based on equal access. Operator-to-operator agreements are permitted (as with the cellular protocol) but subject to review/approval by the administrations. Signed: May 16, 1995.

- Paging:

  929-930/931-932 MHz: *Protocol Concerning the Use of the 929-930 MHz and 931-932 MHz Bands for Paging Services Along the Common Border*. This Protocol establishes a common plan for the equitable use of the band for one-way paging within a 120 km distance from the common border. It identifies priority channels each administration. Twelve channels are designated as shared. The Protocol also allows for operators in both countries to form joint operating partnerships to expand service areas and avoid transborder conflicts. Signed: February 27, 1997.

- Aeronautical Radionavigation and Communications:

  Protocol Concerning the Use of the Bands Allocated to the Aeronautical Radionavigation and Aeronautical Communications Services Along the Common Border. This Protocol establishes a procedure for the coordination of frequency assignments in various identified frequency bands for the aeronautical radionavigation and aeronautical communications services along the common border. It allows each administration to use all the channels in each frequency band, provided it does not cause harmful interference to stations in the other country. Signed: April 26, 1996

There are six additional non-broadcasting terrestrial agreements in effect between the U.S. and Mexico that concern spectrum use: (1) an agreement concerning multipoint distribution services (signed at Queretaro 1992); (2) an agreement concerning the use of radio frequencies for firefighting and other emergency relief efforts (signed in Washington 1998); and (3) four agreements concerning satellite services.

- Multipoint Distribution Services:

  2500-2686 MHz: *Agreement Between the Government of the United States of America and the Government of the United Mexican States Concerning the Assignment of Frequencies and Usage of the 2500-2686 MHz Band Along the United States-Mexico Border*. The purpose of this agreement is to establish a procedure for the assignment of channels and use of the 2500-2686 MHz band for point-to-multi-point distribution services within 80 kilometers of the common border. The 31 channels, each having a 6 MHz bandwidth, are divided into 8 groups (labeled A through H). Assignment of these groups is based on specific coordination criteria, and excluding the locations specified in the Annexes, the groups are available for use by both administrations. This agreement was signed on August 11, 1992 in Queretaro, Mexico and entered

into force on July 2, 1993. The agreement was amended to cover digital MDS systems through an exchange of diplomatic notes dated October 1, 1998 and October 23, 1998.

- Firefighting and Emergency Use Frequencies:

  Memorandum of Understanding Between the Department of Agriculture Forest Service and the Federal Communications Commission of the United States of America and the Secretaria de Comunicaciones Y Transportes of the United Mexican States for the Use of Radio-Frequencies, Coordination and Cooperation for Emergency Purposes. The agreement reserves certain radio frequencies for firefighting and other emergency use in the border areas, significantly improving the ability of both the U.S. and Mexico to protect lives and property along the U.S.-Mexico border. The Agreement also encourages the parties to minimize use of these frequencies outside of the border area and includes procedures for coordinating frequency use and addressing any interference that may occur. In addition, the agreement establishes a program that will allow Mexico to use certain U.S. radio equipment. Signed: December 9, 1998.

- Satellite Services:

  5925-6425 MHz: *Agreement Between the Government of the United States of America and the Government of the United Mexican States Regarding an Earth Station Coordination Procedure*. This agreement covers the band 5925-6425 MHz It establishes a procedure for coordinating the operation of earth stations that are part of one or more fixed-satellite service networks with terrestrial fixed stations in the same band. Signed: July 2, 1991, in Chestertown, MD. It entered into force on February 2, 1993.

  17.7-17.8 GHz: *Agreement Between the Government of the United States of America and the Government of the United Mexican States on the Use of the 17.7-17.8 GHz Band*. It establishes sharing conditions for use of the band to facilitate operation of the fixed and broadcasting-satellite services on both sides of the common border. Signed: June 23, 1993, in Washington, DC.

  Memorandum of Understanding for Intersystem Coordination of Certain Geostationary Mobile Satellite Systems operating in the bands 1525-1544 MHz, 1545-1559 MHz, 1626.5-1645.5 MHz, and 1646.5-1660.5 MHz. This Multilateral Arrangement was signed in Mexico City and it facilitates the operation of the AMSC system of the U.S. Signed: June 19, 1996.

  The *Agreement Between the Government of the United States of America and the Government of the United Mexican States Concerning the Transmission and Reception of Signals from Satellites for the Provision of Satellite Services to Users in the United States of America and the United Mexican States.*

Signed: April 28, 1996. The following Protocols are associated with the Agreement:[15]

- *Protocol Concerning the Transmission and Reception of Signals from Satellites for the Provision of Direct-to-Home Satellite Services in the United States of America and the United Mexican States.* Signed: November 8, 1996. Entered into force November 11, 1996.

- *Protocol Concerning the Transmission and Reception of Signals from Satellites for the Provision of Fixed-Satellite Services in the United States of America and the United Mexican States.* (This protocol does not include services as defined in DTH Protocol, signed November 8, 1996.) Signed: October 16, 1997.

- *Protocol Concerning Transmission and Reception of Signals from Satellites for the Provision of Mobile-Satellite Services and Associated Feeder Links in the United States of America and the United Mexican States.* Signed: December 21, 1998.

Additional information on the agreements for which the FCC has coordination responsibilities is listed in Appendices A and C.[16]

D. Overview of Activities and Accomplishments[17]

February 1997 Bilateral on Broadcast Matters. This meeting was limited to discussions and exchange of information concerning DTV. This included review of developments in the U.S. and Mexico, review of databases of operating analog (NTSC) stations needed to be protected, consideration of planning principles, and interim planning arrangements. The U.S. presented a draft Memorandum of Understanding intended on establishing the principles to be applied in order to allow temporary use of the existing TV bands for DTV until a new or revised TV Agreement can be negotiated.

February 1997 Bilateral on Non-Broadcast Matters. This meeting included a brief discussion of coordination procedures concerning radio frequencies used in fighting forest fires in Southern California. The main topic concerned discussions on a draft protocol on paging in the 929-930 MHz and 931-932 MHz bands in the border area and resulted in the signing of a protocol on February 27, 1997.

March 1997 Bilateral on Broadcast Matters. This meeting was limited to discussions and exchange of information concerning DTV and DARS. This included review of developments in the U.S. and Mexico, review of databases of operating analog

[15] A complete listing of the frequencies protected by the following Protocols can be found in Appendix C.

[16] The tables in Appendix A present this information organized by frequency band.

[17] A summary of meetings held prior to 1997 can be found in the Division's previous report, published in 1997.

(NTSC) stations needed to be protected, consideration of planning principles, and interim planning arrangements for DTV. The draft Memorandum of Understanding was reviewed, revised, and then signed on April 2, 1997. This understanding allows the U.S. to go forward with the timely introduction of DTV in the U.S.-Mexico border area.

June 1997 U.S./Mexico Bilateral on Radiocommunications/Satellite Matters. The U.S. tabled its version of the firefighting draft arrangement. A draft Terms of Reference was tabled for a new working group on spectrum planning to be called the Working Group for the Planning of Radio Spectrum (WGPR), which will meet 2 or 3 times a year, in conjunction with other meetings. There were discussions on fixed users in the 18 GHz band being moved to the 24 GHz band and on the recent rulemaking proposal for space and terrestrial service sharing. Mexico discussed plans for auction in the 3.4 - 3.7 GHz band for FWA.

February 1998 U.S./Mexico Bilateral Meeting/WGPR. There was an update on the firefighting agreement, on the 3.4-3.7 GHz band and on the exchange of paging databases. There was also discussion on modifying the current MDS agreement to include digital MDS operations. For the WGPR portion of the meeting, the U.S. submitted the following information: auctions for GWCS and public coast station frequencies, WCS, the 18 and 24 GHz bands, and the 36-51 GHz band.

April 1998 U.S./Mexico Bilateral Meeting/WGPR. There were discussions on the following: revising the MDS agreement to include digital systems, a review of FM/TV Channel 6 interference and the status of DTV. After the meeting between U.S. and Mexican government officials, there was a meeting with the FCC DARS licensees. There was a follow-up conference call to continue discussions on the firefighting agreement, exchange of paging service database information, cross-border point-to-point microwave links, LMDS, Public Coast Stations 156-162 MHz and 406.1-420 MHz, and WCS.

June 1998 U.S./Mexico Bilateral Meeting. Discussions on XETV Channel 6/KSDS FM and the Mexican TV Channel 3/Cox Cable in San Diego interference cases, and concerning DTV second channels. Mexico distributed its DTV allocation table. Two interference cases were resolved.

September 1998 U.S./Mexico High Level Meeting. Senior level U.S. and Mexican officials met to discuss DARS. In addition, the parties agreed to finalize an agreement concerning digital MDS systems and an agreement reserving certain frequencies in the border area for firefighting and other emergency use, and adopted a 1998-1999 U.S.-Mexico Work Plan.

January 1999 U.S./Mexico Bilateral Meeting/WGPR. There were discussions on DARS spectrum requirements, status, and timeframe for implementation, and a work plan was adopted. In addition, the following special cases were discussed: Channel 3/Cox Cable, TV Channel 6/KSDS-FM, and station KTCT. Also discussed was the status of the AM verification project, DTV update, and terrestrial digital audio broadcasting. In a

subsequent conference call, the WGPR discussed the 162-174 MHz band, cross-border point-to-point microwave links, frequencies and locations of paging stations, and Mexico's firefighting frequencies.

May 1999 U.S./Mexico DARS Bilateral Meeting. There were updates on the following issues: U.S. DARS systems protection of Mexican terrestrial systems, definition of Mexican DARS system, and status of U.S. DARS licensees. Protection requirements for NASA deep space network operations at Goldstone, CA in the 2290-2300 MHz band were also discussed.

E. Issues for Future Action

Future issues for discussion include agreements concerning DARS, WCS, cross-border point-to-point microwave links, and two-way MDS. Additional discussions with Mexico will focus on completion of the AM database verification process. The U.S. and Mexico will also consider coordination agreements in bands subject to refarming.

V. MULTILATERAL NEGOTIATIONS AND AGREEMENTS

A. AM Broadcasting

Because of the long distances AM signals can travel at night via skywave propagation, AM agreements must cover a much larger geographic area, are much more complex, and result in the need to coordinate with other countries beyond Canada and Mexico. Complex engineering studies are required to analyze interference issues because of the effects of the ionosphere on the propagation of electromagnetic waves in the AM frequency band.

In addition to bilateral agreements, four ITU multilateral agreements are in force affecting the use of AM broadcasting frequencies in the United States. They include the *North American Regional Broadcasting Agreement,* 1950 (NARBA), the *Regional Agreement for the Medium Frequency Broadcasting Service in Region 2, Rio de Janeiro, 1981* (1981 Rio Agreement), the *Regional Agreement Concerning the Use by the Broadcasting Service of Frequencies in the Medium Frequency Bands in Regions 1 and 3 and in the Low Frequency Bands in Region 1, Geneva, 1975* (1975 LF/MF Agreement), and the *Regional Administrative Radio Conference to Establish a Plan for the Broadcasting Service in the Band 1605-1705 kHz in Region 2, Rio de Janerio, 1988* (1988 Rio Agreement).

The NARBA agreement governed the allotment and use of all AM (535-1605 kHz) stations for the United States, Cuba, Canada, the Dominican Republic, and the Bahamas until it was effectively superseded by the 1981 Rio Agreement. Technically, NARBA still applies between the U.S., Bahamas, and the Dominican Republic, since these countries have not formally abrogated the agreement.

The 1981 Rio Agreement affects AM broadcasting assignments in the Americas and contains criteria that significantly differs from many NARBA provisions concerning interference protection, including the elimination of clear channels. It provides for separate bilateral agreements as long as they are consistent with its provisions. To provide for greater domestic flexibility and, in some cases, greater interference protection, the U.S. entered into negotiations with both Canada and Mexico culminating in agreements signed in 1984 and 1986, respectively.

The 1975 LF/MF Agreement establishes the plan and associated provisions for AM broadcasting assignments outside of the Americas. It also governs the use of the AM band in U.S. territories in the South Pacific, such as Guam and Saipan. The technical criteria in some ways are different from those of the 1981 Rio Agreement. For example, channel spacing is 9 kHz instead of 10 kHz used in the 1981 and 1988 Rio Agreements.

The 1988 Rio Agreement affects AM broadcasting assignments in the Americas for the use of the expanded AM band (1605-1705 kHz). It also provides for separate bilateral agreements as long as they are consistent with its provisions. As in the case of the 1981 Rio Agreement, the U.S. entered into bilateral negotiations with both Canada

and Mexico. An interim working arrangement with Canada was reached in 1991, and an agreement with Mexico was signed in 1992.

B. International Broadcasting

Transmissions of high frequency (HF), or shortwave international broadcast stations, are intended for direct reception by the general public in foreign countries.[18] These stations use high power transmitters and directional antennas and may broadcast to several areas of the world, simultaneously, using multiple transmitters and antennas. There are both government and private international broadcast stations. The U.S. government operates the Voice of America, Radio Free Europe/Radio Liberty, and Radio Free Asia under the Broadcasting Board of Governors. The FCC regulates privately owned international broadcast stations, which includes 23 licensees with a combined total of 64 transmitters and 94 antennas.

All stations in this service operate without exclusive use of any frequency, and must share the allocated spectrum with all other international broadcasters in the world. As a result of seasonal propagation changes, stations may have to make frequency changes regularly. Accordingly, frequencies are coordinated and authorized on a seasonal basis. The potential for mutual interference around the world is great because these signals travel extreme distances.

In 1963, an informal frequency coordination group (1963 group) was formed for the purpose of reducing mutual interference among several large western nation broadcasters. Today this group is currently composed of representatives of the International Broadcast Bureau (IBB), Merlin Communications Inc., Deutsche Welle, Radio Nederland, Radio Canada International and the FCC. The IBB is responsible for the frequency coordination of the US government broadcasters under the Broadcast Board of Governors. Merlin Communications Inc. is responsible for the frequency coordination of the British Broadcasting Corporation. In 1990, another informal group was formed which currently includes the aforementioned broadcasters plus broadcasters from Eastern and Western Europe, Russia, Turkey, Iran, the Arab States Broadcast Union (ASBU), South America, and South Africa.

The success of the above-mentioned informal groups played a pivotal role in the ITU World Radio Conference in 1997 (WRC-97) adopting the first ever planning method for the HF international broadcasting service. The planning method adopted is the use of regional coordination groups. Currently there are two ITU registered regional coordination groups, the High Frequency Coordination Committee (HFCC) and Asian Broadcast Union High Frequency Committee (ABU-HFC). The FCC has been a member of the HFCC since 1994. The FCC has also attended, as an observer, one of the coordination conferences hosted by the ABU in 1997.

[18] HF Broadcasting is regulated under Part 73, Subpart F of the Commission's Rules, 47 C.F.R. Sec. 73.701 *et seq.*

The final acts of WRC-97 concerning HF were implemented January 1, 1999 and required HF notifications to be made under procedures detailed in Article S12, replacing the previous procedure under Article 17.

VI. SPECTRUM POLICY

Radio spectrum represents a vital, yet limited, resource. Effective spectrum management plays a crucial role in enabling people to communicate. Wireless communications serve to inform, entertain, educate and protect people around the world. Moreover, wireless systems enhance competition by providing greater consumer choice.

The International Spectrum Branch of the International Bureau's Planning and Negotiations Division works to ensure that Americans reap the benefits of this important resource to the fullest extent possible. Frequency allocations, the process of dividing the radio spectrum into blocks or bands of frequencies specified for a particular type of service, serve as a critical component in spectrum management. In the United States, the FCC and the NTIA share responsibility for spectrum management. While NTIA manages the federal government's use of spectrum for defense and other federal purposes, the FCC has authority over commercial spectrum usage as well as that of local and state governments. Because radio waves transcend national borders, and because an increasing number of services are provided on a global basis, international spectrum coordination constitutes a critical component of the allocation process. The World Radiocommunication Conferences (WRCs) of the ITU serve as the principal vehicles for international spectrum allocation.

The International Spectrum Branch plans for, and participates at, the WRCs. The Branch develops, in coordination with the FCC's Bureaus and Offices, agency positions for use in U.S. preparations for regional and international spectrum meetings leading up to, and including, the WRCs. The Branch makes sure that U.S. international spectrum policy comports, where appropriate, to domestic wireless policies. The Branch works closely with NTIA and the Department of State to develop U.S. positions that benefit U.S. government, industry and consumers and that serve the global community. At WRCs, the Branch works as a part of the U.S. delegation to build regional and global support for U.S. views and initiatives by engaging other administrations and organizations in constructive discussions.

For more than two decades, the United States has been undergoing a transition from extensive regulatory planning in its spectrum management toward a dynamic market-based approach. The rapid evolution of wireless technology makes it difficult for any spectrum regulatory body to forecast what services will be available or which frequency range will be efficient for a given service. The International Spectrum Branch generally relies on market-based approaches to shape spectrum management, allowing flexibility to respond to the ever-changing wireless communications market. Because the ITU schedules WRCs every two to three years (with specified agenda), the Branch can work within the international process to ensure that the ITU's Table of Allocations are kept flexible and current.

The International Spectrum Branch is leading the FCC's preparations for WRC-2000. WRC-2000 will address many issues of critical importance to U.S. industry, government and consumers. At WRC-2000, FCC staff will work with other

administrations to allow proposed Non-Geostationary Satellite Systems to enter the market, while protecting incumbent U.S. Geostationary Satellite Systems from NGSO interference; to promote the flexibility that U.S. companies will need to compete in, and bring U.S. consumers the benefits of, the 3rd Generation wireless market; and to ensure, through the WRC process, that spectrum is available to accommodate innovative new technologies and competitive telecommunications services.

VII. NOTIFICATIONS

A. Background

Notifications are data submissions to other administrations or the ITU that are necessary to fulfill U.S. obligations under ITU treaties, other multilateral or regional agreements, and bilateral agreements with Canada and Mexico. Coordinations are exchanges of information among potentially affected administrations for the purpose of resolving interference issues. The notification and coordination processes together provide U.S. stations with protection against harmful interference from foreign stations.

The Notifications Branch of the International Bureau's Planning and Negotiations Division is responsible for performing all notifications required by bilateral, multilateral, and ITU treaties and agreements to which the U.S. is a signatory. While there are similarities in notification requirements among the various services and agreements, there are also a variety of elements and procedures that vary from service to service. For example, completion of the ITU registration process for AM radio requires that applicable regional agreement provisions are completed before application of the procedures for recordation of frequency assignments in the ITU's Master International Frequency Register. Another specialized procedure is the Advanced Publication requirements for satellite systems. Advanced Publications are used in certain space system services as an early step in the registration process to provide an initial notice to other administrations that a particular satellite system is being planned. This facilitates coordination and planning of satellite systems early in the design process before rigid design decisions are finalized. Other unique procedures and recording requirements are discussed below in individual sections related to particular services.

B. Notification Services

The International Bureau's Planning and Negotiations Division performs all international notifications, including assignments of stations licensed by the FCC and those authorized by the NTIA and the International Telecommunications Satellite Organization (INTELSAT) that need to be notified to the ITU.[19] The Notifications Branch provides the following six notification services:

1) All terrestrial frequency assignment notices to the ITU pursuant to Article S11 of the ITU Radio Regulations;

2) Notification and recording in the ITU Master International Frequency Register of Frequency Assignments of all U.S. terrestrial radiocommunication stations;

3) AM notifications to the ITU pursuant to the AM broadcasting under the 1975 LF/MF Agreement, 1981 Rio Agreement, and 1988 Rio Agreement;

4) Coordination and notification of satellite activities to individual countries and the ITU under Articles S9 and S11 of the ITU Radio Regulations;

5) Multilateral coordination of FCC licensed HF International Broadcasting stations pursuant to Article 17 of the ITU Radio Regulations; and

6) Notification of changes in the use of AM, FM, TV, multipoint distribution service (MDS), ITFS, aeronautical, and U.S. fixed land mobile frequencies with Mexico and Canada pursuant to bilateral agreements with each country.

Tables illustrating the overall volume of notifications, fluctuations over the quarters spanning the period from October 1995 to June 1999, and variations by service are contained in Appendix F. The total number of notifications fluctuated dramatically from one quarter to the next, reaching a peak of 13,188 in the summer of 1995, to a minimum of 6,422 in the third quarter of 1998. Notifications for the period 1995 through 3rd quarter 1999 totaled 157,362 with nearly half (66,628) processed through an automated system with Canada.

The Bureau also coordinated and submitted seasonal broadcasting schedules for 22 shortwave broadcasting licensees reflecting a total of 10,043 frequency hours for this reporting period. This volume illustrates the significant coordination activity associated with the numerous schedule changes inherent in this service.

[19] The FCC chairs the "International Notification Group" (ING), which is a permanent sub-group of the IRAC. The ING administratively coordinates the notification correspondence between the U.S. administration, the ITU, and other countries; thus, the FCC serves as a central "post office" for all notifications and coordinations, including those for government frequency assignments authorized by the NTIA and similar correspondence of INTELSAT.

By far the most labor-intensive notifications, however, are in the domestic broadcast services, particularly AM radio. Each notification, whether it is received from a foreign administration, appears in ITU Weekly Circulars, or is proposed by the U.S., requires complex engineering studies to determine possible interference.

No processing backlogs exist in the notifications area, despite the significant volume of notifications which require evaluation. There are, however, cases where the FCC may not act on a pending application because of international constraints. For instance, cases that may not be specifically addressed under the terms of the pertinent bilateral Agreement, such as FM-to-TV channel 6 interference or TV interference to cable operations, are negotiated on an individual basis. Other cases may involve applicants who specifically request special coordination of their proposals that do not strictly adhere to the terms of the current Agreement. Any disputed proposals are negotiated on a case-by-case basis. The Commission attempts to negotiate international Agreements to mirror as closely as possible our domestic standards. But because foreign Administrations have their own domestic priorities and standards for their stations and because the Commission's own standards may undergo rapid change, the bilateral Agreements that the Commission has signed with our foreign counterparts often do not address all the technical issues from our perspective. Therefore, the Notifications Branch attempts to accommodate U.S. applicants as much as possible in their requests for coordination and special consideration through direct involvement in each case. There are 16 AM applications that are pending due to delays experienced with the ITU registration process or with the Mexican Verification Project.

C. Database and Automation Projects

The FCC is continually working to increase the efficiency and accuracy of the notifications process, both through improvement of assignment databases and in the coordination with other administrations in the development of automated notifications processing systems as follows:

ITU Information. A significant amount of information issued by the ITU is now accessed electronically by FCC staff, saving considerable resources. Full utilization of this information was achieved by software configured by the staff of the Planning & Negotiations Division. The ITU information, which includes the International Frequency List, Space Radiocommunications Stations, Weekly Circulars, and ITU-Radiocommunications (ITU-R) Recommendations, is available electronically in the FCC's Consolidated Public Reference Room. The Notifications Branch manages the procurement and distribution of ITU publications for all offices of the FCC. These publications consist of the final acts of telecommunication conferences, lists of radio stations and satellite networks, operational bulletins, newsletters, weekly circulars, recommendations, handbooks, radio regulations, etc.

Software Implementation for ITU's TerRaSys Project

In an ITU Circular Letter dated April 12, 1995, the Radiocommunications Bureau of the ITU outlined its plans for modernizing its information systems. With this modernization, the ITU expects to improve services to administrations; facilitate the sharing of PC-based software and data with administrations and other users; and maximize the flexibility and minimize the costs of implementing changes to the Radio Regulations, procedures, and enhancements in technology. To achieve these objectives, the ITU intends to design an entirely new information system called the Terrestrial Radiocommunication System (TerRaSys). The conversion to TerRaSys will require changes in the formats of notifications, both paper and electronic. The Notifications Branch provides input and suggestions to the ITU as well as request clarification of some of the significant issues affecting FCC processes. The TerRaSys project has been a long-term project, spanning a period of several years and is now nearing completion. The Notifications Branch has been involved since its inception and will continue work on the project until all work is finalized.

ITU Space Services Automation. Due to an increasing backlog in processing submissions for coordination and notification of assignments in the space services, the ITU developed an electronic notification form and additional software for distribution and analysis of electronic publications. The Notifications Branch staff and other government agencies analyzed beta versions of the electronic form software and submitted comments and suggestions to the ITU. The electronic form and space weekly circular are now available on CD and accessible to employees on the FCC's network.

HF Coordination. In 1995, coordination information concerning U.S. shortwave radio licensees was placed on the Internet at the FCC's World Wide Web site. Due to the frequency with which HF assignments are changed and the complexity of the coordinations for this service, immediate access to relevant information over the Internet provides significant advantages to licensees and the public.[20]

AM, FM & TV Broadcasting. The most significant broadcast database project involving Mexico concerns the AM radio service. In 1995, the U.S. and Mexico agreed to procedures and a timetable for verification of 3,480 Mexican and 10,046 U.S. AM assignment records in an updated database. Although the work associated with the AM database verification has been more complex and time consuming than initially anticipated, substantial progress is being made by both Mexico and the United States. When completed, the database will remove longstanding uncertainties that have affected existing and prospective AM broadcasters in the U.S.

The Notifications Branch maintains a tracking system of all FM and TV proposals that are coordinated with Canada, Mexico and the ITU. This system allows the branch to track the status of all pending proposals. It also provides a historical reference that assists in confirming and resolving cases in which U.S. FM and TV licensees may encounter

[20] The FCC Public Notice dated October 27, 1995, concerning the placement of this information on the Internet is contained in Appendix E.

interference. The branch also conducts periodic database exchanges with Canada and Mexico in order to verify data and insure accuracy, since erroneous or obsolete database records often preclude the placement of new FM and TV stations.

Bilateral Non-Broadcast Coordination. No database or automation projects with Mexico currently exist for non-broadcast services. The U.S., however, conducted extensive discussions with Mexico concerning a shared mutual interest of having more accurate and electronically accessible information on each country's non-broadcast frequency allocations and station assignments. Microwave coordinations with Mexico are processed manually. The decrease is reflective of the Mexican's use of the auction process.

The total number of transborder microwave coordination actions with Mexico for Fiscal Year 1995 was 347. For 1996, the total was 1022. The totals for 1997 and 1998 were 241 and 17 respectively. For the first three-quarters of Fiscal Year 1999, the total number of transborder microwave coordination actions with Mexico was 3.

The most significant non-broadcast automation project with Canada is the coordination serial number (COSER) system for coordination of frequency assignments of stations operating above 30 MHz. By treaty, technical parameters of such stations within the border zone must be exchanged before licensing and operation. The FCC and Industry Canada maintain databases concerning U.S. and Canadian licensed operations respectively. Each country can access the other country's database automatically. Maintenance of the U.S. database involves several different offices within the FCC. Technical meetings between participating FCC offices and Canadian counterparts are held approximately every other year to clear database problems and review procedures.

In Fiscal Year 1995, the total number of automated COSER system coordinations was 16,591. For 1996, the total was 15,603. The totals for 1997 and 1998 were 12,295 and 12,852 respectively. For the first three-quarters of Fiscal Year 1999, the total number of automated COSER system coordinations was 9287.

D. Broadcast Services - Notifications

1. AM Broadcasting

(a) AM Notifications for Canada & Mexico

The Notifications Branch conducts all engineering studies required in connection with U.S. AM notifications to Canada and Mexico and evaluations of all notifications received from those administrations. The studies involve technical and legal aspects of the proposals. Separate interference studies are necessary for day and night operations of stations in the AM band. Daytime studies require groundwave analysis of co-channel and three upper and lower adjacent channel frequencies. Night studies require complex analysis of the cumulative effects of multiple nighttime stations utilizing the root-sum-square (RSS) method. Also, for night studies involving U.S. Class A stations, an analysis

must be performed to ensure that the nighttime 0.5 mV/m - 50% nighttime skywave contour is adequately protected. Further, on certain frequencies, protection during critical hours (the transitional time near sunrise and sunset) must be analyzed.

After review of the notifications, the staff prepares detailed written comments and engineering reports on the acceptability or unacceptability of all Canadian & Mexican AM notifications. These reports form the basis for the future acceptability of all Canadian and Mexican proposals as well as related U.S. AM station proposals.

The total number of AM Notifications for Canada and Mexico for 1995 was 1561. In 1996, the total was 1642. The totals for 1997 and 1998 were 1031 and 1100, respectively. In the first three-quarters of Fiscal Year 1999, the total number of AM Notifications for Canada and Mexico was 644.

(b) ITU-AM Registrations

The ITU registration process for AM facilities has two separate components. First, in order to ensure protection to United States AM facilities, the ITU must be properly notified of U.S. stations parameters, which involves a multi-step process in which stations notify the ITU in accordance with the framework of the applicable Plan Agreement, either the 1981 Rio Agreement or the 1975 LF/MF Agreement, and then follow-up with proper Article 12 notification for inclusion in the ITU's International Frequency List (IFL). Completion of this process entitles the U.S. station to protection from potential interference from any station worldwide. The second component involves continual comprehensive engineering review of the ITU's Weekly Circulars and its applicable associated Special Sections (RJ81 and GE75) in order to ascertain if any recently published foreign proposed facilities would cause impermissible interference to United States stations. These engineering studies often require technical analysis to determine whether adequate protection is being provided to U.S. stations. Additionally, Article 12 studies may involve analyses utilizing the procedures contained in IFRB Circular-letter No. 662, IFRB Rules of Procedure for the Assignments of the Broadcasting Service in the Band 525 - 1606.5 kHz, otherwise known as the "Finding Diagram" method.

After the studies have been completed, detailed finding reports are prepared which document the results of the studies and serve as an historical reference for future studies. Depending upon the results of the engineering analysis, any necessary correspondence is prepared and sent to the ITU or the applicable foreign administration.

The total number of ITU AM registrations for Fiscal Year 1995 was 896. For 1996, the total was 993. The totals for 1997 and 1998 were 1078 and 1510 respectively. For the first three-quarters of 1999, the total number of ITU AM registrations was 861.

2. FM Broadcasting

(a) Canada and Mexico Agreements

The potential for interference from FM signals generally extends for a few hundred kilometers. For this reason, it is necessary only to coordinate most U.S. FM stations with Canada and Mexico and only within a specified distance on either side of the respective border. An agreement for the allotment and use of FM (88-108 MHz) channels in the U.S./Canada border area was signed in 1947. A similar agreement was signed with Mexico in 1972. Significant changes to FCC rules have been made since the signing of these agreements. For this reason, negotiations with both countries were conducted to update provisions relative to domestic rules and develop improved technical standards and procedures to more effectively deal with congestion in the border areas. New agreements were signed with Canada and Mexico in 1991 and 1992, respectively. Included in each Agreement are tables of allotments and technical standards for the Administrations to consider new allotments and assignments within 320 km of their respective borders (see U.S./Canadian Border Coordination Map).

(b) FM Notifications to Canada, Mexico and ITU

FM allotments and assignments are notified and evaluated under the pertinent bilateral agreement or international treaty. The Planning and Negotiations Division staff performs engineering evaluations on all U.S. and foreign proposals to insure acceptability under the technical criteria specified in each Agreement. After a review of each proposal, the staff coordinates each U.S. proposal or responds to each foreign proposal through a standard notification letter. FM notifications in Puerto Rico, the Virgin Islands, and America Samoa are sent to the ITU for coordination. These evaluations are made according to ITU-R technical criteria.

Each Agreement sets forth specific time frames within which to respond to an international referral. If the FCC does not respond to the referral within this time frame, the foreign Administration has the right to classify the proposal as acceptable, regardless of its actual potential for causing interference.

Foreign administrations often submit station referrals in large batches, which frequently contain technical errors that might cause interference to U.S. stations. The resolution of these discrepancies often involves direct correspondence (written and/or by telephone) with foreign counterparts. The FCC prefers to coordinate FM stations on a case-by-case basis rather than by group referrals, thus decreasing the amount of time an applicant must wait before the station can commence operation.

The total number of FM notifications processed for Fiscal Year 1997 was 1208. For 1998, the total was 1289. For the first three-quarters of Fiscal Year 1999, the total number of FM notifications processed was 737.

3. TV Broadcasting

(a) Canada and Mexico Agreements

Working arrangements for the allotment and use of VHF (54-72 MHz, 76-88 MHz and 174-216 MHz) and UHF (470-806 MHz) television channels were established between the United States and Canada in the Television Agreement of 1952. A revised Agreement was signed in 1994, which combined the two working arrangements and revised LPTV technical standards. The Agreement of 1994 includes tables of allotments and technical standards for both administrations to consider new allotments and assignments within 400 kilometers of the border and contains technical criteria for the coordination of LPTV stations (see U.S./Canadian Border Coordination Map). A draft Letter of Understanding is currently under evaluation between the U.S. and Canada regarding the use of Digital Television Broadcast Services within 400 km of the common border. DTV coordination requests, however, have been proceeding under an informal basis for the past two years.

Similar Agreements are in effect with Mexico. The VHF Television Agreement of 1962 covers the allotment and use of VHF channels within 400 km of the border, while the UHF Television Agreement of 1958, modified in 1982, covers UHF allotments within 320 km of the border. Modifications to both Agreements were made in 1988 to provide for coordination of LPTV stations (see U.S./Mexican Border Coordination Map). A Memorandum of Understanding, signed in July 1998, currently governs the use of Digital Broadcasting Services within 275 km of the U.S.-Mexico common border.

(b) TV Notifications to Canada, Mexico and ITU (including low power TV and digital TV)

Television allotments and assignments are notified and evaluated under the pertinent bilateral agreement or international treaty. Notifications Branch staff conducts engineering evaluations on all U.S. and foreign proposals to ensure acceptability under the technical criteria specified in each agreement. Bilateral engineering evaluations are based on separation standards and contour overlap. Stations which do not meet the separation standards are classified as short-spaced and are evaluated by contour overlap. With regard to Canadian Agreements, interference from a new station to an existing station is permissible as long as the interference zone occurs over water or within the land areas of the administration proposing the new station.

Overlap studies are conducted by employing the CURVES computer program, which calculates field strength contours based on effective radiated power (ERP) and height above average terrain (HAAT), and then by entering these contour values into a plotting program in order to examine where the overlap occurs geographically. U.S. and foreign directional antenna patterns for short-spaced stations are extrapolated from graphs listing the relative field of the station. Based on this relative field strength and the maximum ERP, the interference contours are calculated and plotted along the relevant azimuths in order to ensure that a station's actual operating parameters do not produce interference. With regard to Mexico, no interference overlap is permissible.

The U.S. DTV Allotment Plan was adopted domestically before Canada or Mexico had finalized versions of their own plans. For this reason, it was necessary to

specially negotiate each of our U.S. DTV early builder applications in order to obtain foreign approval. The Notifications Branch was successful in obtaining foreign approval on all of the major market applications before any bilateral agreements were in place.

Since the formal bilateral criteria to evaluate DTV proposals in the U.S.-Canada border zone is still being revised, current U.S. DTV proposals are evaluated under the proposed Canadian technical standards until a mutually agreed upon criteria is in place. If a proposal causes predicted overlap using standard HAAT values and the Commission's curves, then a more detailed analysis to determine the extent of interference is performed using the Longley-Rice propagation model. Disputed cases are resolved through direct negotiation with Canada.

To date, 100 U.S. DTV station applications have been coordinated with and approved by Canada and 22 U.S. DTV applications have been coordinated with and approved by Mexico. These figures represent specific applications only. The number of DTV allotments which Canada and Mexico have formally approved is much greater: 552 U.S. DTV allotments have been approved by Canada and 115 U.S. DTV allotments have been approved by Mexico. While the Commission has approved a plan of allotments for Canada (1029 Canada DTV allotments) and Mexico (122 Mexico DTV allotments), neither country has submitted any proposal for an actual DTV operation.

ITU FM and TV calculations involve criteria specified in ITU-R Recommendations and Reports. When evaluating a station, such factors as terrain profile and propagation characteristics (i.e., over land or water) are considered when calculating whether or not harmful interference is produced.

After a review of each proposal, the Notifications Branch staff coordinates each U.S. proposal or responds to each foreign proposal through a standard notification letter. TV notifications in Puerto Rico, the Virgin Islands, and America Samoa are sent to the ITU for coordination. These evaluations are done according to ITU-R technical criteria.

The total number of TV notifications processed in Fiscal Year 1997 was 799. For 1998, the total was 290. For the first three-quarters of Fiscal Year 1999, the total number of TV notifications was 209.

E. International Notifications

1. Frequency Assignments for the Fixed and Mobile Services

The international notification of frequency assignments of stations capable of causing harmful interference to the stations of other countries greatly enhances frequency management by reducing the likelihood of harmful interference, providing a useful basis for resolving interference cases when they occur, and reducing potential economic losses that could run into the millions of dollars. The notified services include land stations communicating with aircraft, ships, and land vehicles. The notification process is essential in providing interference-free use of frequencies for public safety.

The total number of fixed and mobile notices sent to the ITU for Mobile Services for Fiscal Year 1997 was 1089. The total for Fiscal Year 1998 was 322. For the first three-quarters of Fiscal 1999, the total number of fixed and mobile notices sent to the ITU for Mobile Services was 90.

2. HF International Broadcasting Notifications

As required by Article 17 and Article S12 the FCC must coordinate operational frequency use for its HF licensees and notification to the ITU. The total number of HF frequency hours submitted during Fiscal Year 1997 was 4035. The total for Fiscal Year 1998 was 4078. For the first three-quarters of 1999, the total number of HF frequency hours submitted was 3125.

3. Satellite Systems

Detailed international coordination of satellite space systems is performed by the International Bureau's Satellite Division, and is not covered in this Report. The Planning and Negotiations Division does, however, exchange all messages for administration-to-administration satellite coordination and transmit notifications, including those for satellite systems, required under international regulations and treaties.

The Notifications Branch serves as the single U.S. contact point for matters involving notifications and coordinations for space service systems. Notifications and coordinations for U.S. non-government, government and INTELSAT systems are transmitted to the ITU and foreign administrations.[21] The Notifications Branch maintains a database of transmittals as well as the current postal and telefax addresses for these foreign destinations.

Incoming correspondence, coordination requests and data are distributed by the Notifications Branch to each of the U.S. sectors (the IRAC's Space Systems Group, the FCC's Satellite Engineering Branch and INTELSAT) as appropriate. The Notifications Branch distributes special sections of the ITU's Weekly Circular containing published data on U.S. and foreign satellite networks[22] to the Satellite Engineering Branch and the FCC's Consolidated Public Reference Room.

The Notifications Branch creates and maintains a file for every domestic and foreign space network published by the ITU or for which information is provided to the U.S. by a foreign administration. These files include all related publications from the ITU and correspondence to and from the ITU and foreign administrations.

The Branch's staff consults with the Satellite Engineering Branch, INTELSAT and government agencies on the satellite-related procedures in the ITU Radio

[21] This function is carried out for the Commission and government agencies under the aegis of the International Notifications Group (ING), a permanent sub-group of the IRAC.

[22] Approximately 2000 copies have been distributed within the Commission since the 1997 Report..

Regulations. In this capacity, the staff represents the FCC at monthly meetings of IRAC's Space Systems Group (SSG) that regulates government space systems.

From October 1997 through June 1999, the Notifications Branch received and distributed 2,652 incoming messages originating with the ITU and other administrations. During the same period, the Branch transmitted 3,088 outgoing messages to foreign points. The Branch reviewed or commented on 6,090 items for the SSG consideration. The Branch also transmitted the following number of items to the ITU and other countries:

75	Advance Publications of planned satellite networks.
137	Coordination Requests required by Article 11, Article 14, and Resolution 46 of the International Radio Regulations.
54	Notifications of satellite networks frequency assignments for registration in the ITU's Master Register.
266	Total.